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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/384,504	08/27/1999	JOHN W. MARSHALL	112025-0166	7925

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CESARI AND MCKENNA, LLP  
88 BLACK FALCON AVENUE  
BOSTON, MA 02210

EXAMINER

BRODA, SAMUEL

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 12/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/384,504

Applicant(s)

MARSHALL ET AL.

Examiner

Samuel Broda

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 October 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### **DETAILED ACTION**

1. This communication is in response to Applicants' Amendment dated 1 October 2002.

Claims 1, 5, and 9 were amended; claims 1-12 are pending.

#### ***Claim Rejections - 35 U.S.C. § 112, First Paragraph***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

- 2.1 Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph.

- 2.2 Regarding claims 1-4 and 9-12, these claims are rejected under 35 U.S.C. 112, first paragraph, because the Specification, while being enabling for generating an approximate model of a remaining portion of a system, does not reasonably provide enablement for generating an approximate mathematical model of a remaining portion of a system. The Specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

- 2.3 Regarding claims 5-8, these claims are rejected under 35 U.S.C. 112, first paragraph, because the Specification, while being enabling for estimating operation of system using hierarchical analysis functions, does not reasonably provide enablement for estimating operation of system using hierarchical analysis mathematical functions. The Specification does

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not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

2.4 In response to the rejection of the claims under Section 102(b) made in Paper No. 6, Applicants amended each independent claim to denote the generation of an approximate “mathematical” model based upon hierarchical analysis. In the remarks on pages 3-7 of the Amendment, Applicants argue that the McDonald et al reference fails to disclose such mathematical models.

However, Applicants failed to indicate the support in the Specification for the “mathematical” models as appearing in the amended claims. The portion of the Specification that most closely supports Applicants’ amendment to the claims appears to be at page 12 lines 1-15, which states in part:

As shown schematically in Figure 4, in the HA model 150 of design 100, functions 82, 84, and 86 are used. In essence functions 82, 84, 86 are mathematical functional abstractions, based upon the physical characteristics of the proposed design in the databases 46, 48 . . . More specifically, function 82 essentially is an approximate mathematical model of the overall timing operation of the module 65 . . . Similarly, function 84 essentially is an approximate mathematical model of the overall timing operation of the connection 70 . . . Also similarly, function 86 essentially is an approximate mathematical model of the overall timing operation of the module 67 . . . (Emphasis supplied.)

While this description of functions 82, 84, 86 each comprise an “approximate mathematical model” suggests the purpose of each function is to approximate timing operations,

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the Specification fails to provide any further description of a kind or type of mathematical model. When compared to the amended claims, it appears that the scope of the claims cover any mathematical model.

***Claim Rejections - 35 U.S.C. § 112, Second Paragraph***

**3.** The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**3.1** Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

**3.2** The term “approximate mathematical model” in claims 1 and 9 is a relative term which renders the claim indefinite. The term “approximate mathematical model” is not defined by either claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

The term “hierarchical analysis mathematical functions” in claim 5 is a relative term which renders the claim indefinite. The term “hierarchical analysis mathematical functions” is not defined by the claim, the specification does not provide a standard for ascertaining the

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requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

In response to the rejection of the claims under Section 102(b) made in Paper No. 6, Applicants amended each independent claim to denote the generation of an approximate “mathematical” model based upon hierarchical analysis. In the remarks on pages 3-7 of the Amendment, Applicants argue that the McDonald et al reference fails to disclose such mathematical models.

However, Applicants failed to indicate the support in the Specification for the “mathematical” models as appearing in the amended claims. The portion of the Specification that most closely supports Applicants’ amendment to the claims appears to be at page 12 lines 1-15, which states in part:

As shown schematically in Figure 4, in the HA model 150 of design 100, functions 82, 84, and 86 are used. In essence functions 82, 84, 86 are mathematical functional abstractions, based upon the physical characteristics of the proposed design in the databases 46, 48 . . . More specifically, function 82 essential is an approximate mathematical model of the overall timing operation of the module 65 . . . Similarly, function 84 essentially is an approximate mathematical model of the overall timing operation of the connection 70 . . . Also similarly, function 86 essentially is an approximate mathematical model of the overall timing operation of the module 67 . . . (Emphasis supplied.)

While this description of functions 82, 84, 86 each comprise an “approximate mathematical model” suggests the purpose of each function is to approximate timing operations,

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the Specification fails to provide any further description of a kind or type of mathematical model and also fails to provide a standard for ascertaining the requisite degree.

**3.3** Taken as whole, one of ordinary skill in the art would not be reasonably apprised of the scope of the invention because of the uncertainty regarding what constitutes an “approximate mathematical model” and “hierarchical analysis mathematical functions.”

**3.4** For the purpose of further claim examination, the Examiner will presume that an “approximate mathematical model” or “hierarchical analysis mathematical functions” correspond to an equation in mathematical form that is capable of being programmed in a computer.

***Claim Rejections - 35 U.S.C. § 102***

**4.** The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

...

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**4.1** Claims 1-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Shepard et al, “Design Methodology for the S/390 Parallel Enterprise Server G4 Microprocessors”, IBM Journal of Research and Development, Vol. 41 No. 4/5, pp. 515-547 (July 1997) (prior art cited in Paper No. 6 and supplied to Applicants).

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**4.2** Regarding claim 1, Shepard et al teaches a computerized method for use in simulating an operation of an electronic system, the method being carried out using a computer system, the method comprising:

generating a physically-accurate description of a first portion of the system, the physically-accurate description comprising actual physical characteristics of the first portion [physically-accurate description of G4 microprocessor input to Pathmill tool via netlist, "configuration file" and "characterization file" that "specifies the input slew and output loading design point used for the determined the sensitivity coefficients for delay and slew"; see page 528 column 1 paragraph 3 through column 2 paragraph 1];

generating an approximate mathematical model of a remaining portion of the system, the model being based upon hierarchical analysis of the remaining portion [static timing analysis using hierarchical approach using "Pathmill" tool used to abstract timing into "black" or "gray" boxes (pages 528-530), with results fed to IBM "EinsTimer" to generate an approximate mathematical models of current (page 530) and voltage (page 531)]; and

using both the physically-accurate description and the approximate model to simulate the operation of the system [models used as part of design methodology, metrics for design quality and design abstraction; sees page 516-517].

Therefore, Shepard et al anticipates claim 1.

**4.3** Regarding independent claims 5 and 9, claim 5 is the system claim corresponding to claim 1, and claim 9 is the computer program product claim corresponding to claim 1. Claims



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5 and 9 are anticipated using the analysis of claim 1, where the “hierarchical analysis mathematical function” of claim 5 corresponds to either the current function on page 530 or the voltage function on page 531.

4.4 Regarding claims 2-3, 6-7, and 10-11, the Pathmill macro-level timing analysis includes a configuration file contains “hints” corresponding to simulation optimization rules for how to handle difficult circuit topologies and thus reduce simulation error. See page 528 column 1 paragraph 3.

4.5 Regarding claims 4, 8 and 11, Shepard et al teaches use of the Pathmill and EinsTimer simulators to handle timing operations.

### *Applicants' Arguments*

5. Applicants argue in the Amendment at pages 3-7 that the rejection made under Section 102 using the reference McDonald et al is inapplicable to the amended claims because:

. . . McDonalds [sic] “gray box” contains only the worst case timing arcs between latches and ports. In sharp contrast, Applicants disclose and claim the use of a mathematical model of a portion of their system, along with a *physically-accurate description of a first portion of said system* and couple the mathematical model and physically accurate description of another portion of their system to generate the full analysis of their system.

Amendment, page 6 paragraph 1 (emphasis in original).

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*Examiner's Reply*

6. In response to Applicants' claim amendments and arguments, the Examiner has replaced the McDonald et al reference with the Shepard et al reference that demonstrates use of the hierarchical analysis of the Pathmill system with the EinsTimer system to generate a mathematical model.

*Conclusion*

7. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

8. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

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9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Samuel Broda, whose telephone number is (703) 305-1026. The Examiner can normally be reached on Mondays through Fridays from 8:00 AM – 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin Teska, can be reached at (703) 305-9704. The fax phone numbers for this group are:

(703) 746-7238 --- for communications after a Final Rejection has been made;

(703) 746-7239 --- for other official communications; and

(703) 746-7240 --- for non-official or draft communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist, whose telephone number is (703) 305-3900.



SAMUEL BRODA, ESQ.  
PATENT EXAMINER